LONDON SOUTH BANK UNIVERSITY

Quantitative Methods

IAF-2-201

Business, Computing &
Information Management

2006-07

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1. UNIT DETAILS

Unit Title:	Quantitative Methods
Unit Level:	2
Unit Reference Number:	IAF-2-201
Credit Value:	1
Student Study Hours:	150
Contact Hours:	48
Private Study Hours:	102
Pre-requisite Learning (If applicable):	Level 1 Quantitative Literacy or equivalent
Co-requisite Units (If applicable):	n/a
Course(s):	BABS/BABA/Combined Honours
Year and Semester	2
Unit Coordinator:	Martin Abram
UC Contact Details (Tel, Email, Room)	X6170, abrammr@lsbu.ac.uk, L113b
Teaching Team & Contact Details (If applicable):	n/a
Subject Area:	Mathematics, Statistics & Foundation Studies
Summary of Assessment Method:	Coursework (Time Constrained Assignment) & Examination

2. SHORT DESCRIPTION

The Unit examines a range of ways of handling, analysing and presenting numerical information. Particular emphasis will be placed on dealing with financial information – annuities, gilts, investment appraisal & portfolio analysis. An introduction to the basic concepts of probability and their application is also included.

3. AIMS OF THE UNIT

The main aim of the Unit is to develop students' ability to express business problems in quantitative terms and to apply an appropriate method to their solution. It also aims, along with the other Level 2 Quants Units (Data Analysis & Quantitative Models for Managers) to provide a base on which to apply quantitative principles, where relevant, to other Units.

All aspects of business involve dealing with numerical information presented in a variety of formats. The Unit aims to give students the tools to handle such information appropriately and with confidence.

4. LEARNING OUTCOMES

4.1 Knowledge and Understanding

- Know and understand the difference between various types of annuities.
- Appreciate the importance of net present value and IRR as ways of evaluating the financial viability of a project.
- Understand how gilts operate in the financial market.
- Understand the principles of independence and mutual exclusivity.
- Appreciate the difference between conditional and unconditional probabilities.
- Understand what constitutes a discrete probability distribution.
- Understand the concept of inefficiency with respect to investment portfolios.
- Appreciate the concept of 'attitude to risk'.

4.2 Intellectual Skills

- Be aware of the various mathematical techniques that can be used to help solve business problems.
- Select the technique appropriate for a given problem and use it correctly.

4.3 Practical Skills

- Calculate present and future values of various types of annuities.
- Calculate the net present value (NPV) and internal rate of return (IRR) of an individual project and interpret the results
- Calculate the current price, interest yield and gross redemption yield of a gilt
- Maximise the total NPV of a set of divisible projects under conditions of capital rationing.
- Carry out sensitivity analysis on the various input values of a financial model
- Use the additive and multiplicative laws to calculate probabilities.
- Use the concept of non-independence to calculate conditional probabilities.
- Find the expected value and standard deviation of a probability distribution.
- Apply the previous to single portfolio investments.
- Identify and reject inefficient portfolios.
- Calculate the covariance of a two-asset portfolio.
- Find the expected return and standard deviation of a two-asset portfolio.
- Apply the concepts introduced in the two-asset model to the three-asset model.

4.4 Transferable Skills

- All of the above

5. ASSESSMENT OF THE UNIT

The assessment will comprise 2 components:-

1. A timed constrained assignment in Session 8 covering the material introduced in Sessions 1 – 6. This will be open book and will carry a 25% weighting.
2. A 2 hour examination at the end of the semester covering ALL the material in the Unit. This will be closed book. However students will be allowed to refer to up to 2 A4 sides of notes prepared by themselves. This will carry a 75% weighting.

To satisfy the examiners candidates must normally achieve an overall mark of 40%. A minimum mark of 30% will be required for each of the two elements above.

6. FEEDBACK

Feedback will normally be given to students 15 working days after the submission of an assignment.

7. INTRODUCTION TO STUDYING THE UNIT

7.1 Overview of the Main Content

Annuities – due, immediate and deferred annuities. Perpetuities. Terminal and present values of all of these.

NPV and IRR – the calculation and interpretation of these from given cash flows. Problems where the cash flows have to be derived from information supplied.

Maximising overall NPV for divisible/non-divisible and mutually exclusive/non mutually exclusive projects. This to be done in cases of both restricted & unrestricted funds.

Sensitivity analysis – determine which input factors (initial investment, annual cash flow, discount factor, time of project etc.) are the most sensitive to change in terms of the viability of a project.

Gilts – the calculation of interest yields, gross redemption yields and market prices.

Probability – concepts of independence and mutual exclusivity. The use of the additive and multiplicative laws of probability to calculate probabilities. Contingency tables. Mortality tables.

Calculation of the expected value of a probability distribution. The application of this to a variety of situations including life expectancy and the value of a single portfolio.

The calculation of the risk associated with an investment portfolio. The concept of inefficiency and the criteria used to select amongst a variety of possible portfolios.

The relationship between covariance and correlation.

The calculation of the expected value and risk associated with a mixed investment of portfolios of 2 and 3 assets.

7.2 Overview of Types of Classes

The teaching strategy will be a mixture of formal lectures together with the opportunity for students to practice the various techniques introduced. During the taught sessions academic staff will be available to give assistance to individual students if and when required. It is essential that students complete all the exercises set during their private study time. Success will not be achieved in this Unit just by reading about the subject. Success will only come from repeated practice of the techniques involved.

7.3 Importance of Student Self-Managed Learning Time

The importance of completing the examples set cannot be emphasised enough. Many of the examples are taken from past examination papers so answering them will give you a very good indication of the level of difficulty and style of question you can expect in the examination. It is not enough to understand how somebody else uses a technique; you must be able to do it yourself. If you are having problems with any of the questions set then you should (in the first instance) ask one of the tutors involved - the structure of the teaching sessions allows for plenty of opportunities to seek such help. In addition, the recommended texts contain a plentiful supply of worked examples of the types encountered in the Unit and students are strongly advised to make use of these. After each week's session lecture notes will be made available on the Unit Blackboard site – access details will be provided during the first lecture. A CD-ROM outlining the main points covered in all the lectures will be made available in Session 13 to assist in the revision process

8. THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

Session 1	-	Introduction
Session 2	-	Annuities
Session 3	-	Annuities (cont.) & Gilts
Session 4	-	Investment Appraisal – NPV & IRR
Session 5	-	Investment Appraisal – NPV & IRR (cont.)
Session 6	-	Sensitivity Analysis
Session 7	-	Introduction to Probability
Session 8	***-***	***Time Constrained Assignment (covering Sessions 1 – 6)***
Session 9	-	Expected Values
Session 10	-	Investment Portfolios – single and 2 Asset
Session 11	-	Investment Portfolios – 3 asset
Session 12	-	Review & 'Catch-up'
Session 13	-	Informal Revision (Optional)

It is important to note that although it is intended to stick to this timetable minor changes may take place from time to time to accommodate the learning patterns of the particular students involved.

9. LEARNING RESOURCES

9.1 Core Materials

Claire Morris	Quantitative Approaches in Business Studies (6th Edition) Prentice Hall, 2003
Les Oakshott	Essential Quantitative Methods for Business, Management & Finance (2nd Edition) Palgrave, 2001
Glyn Burton et al	Quantitaive Methods for Business & Economics Prentice Hall, 2002
Sonia Taylor	Business Statistics Palgrave, Hall, 2001
A Francis	Business Mathematics & Statistics (5th Edition) Letts

None of these texts are essential for the completion of the Unit but they may be found useful as reference material or, more particularly, as a source of extra examples.

9.2 Optional Materials

It is assumed that students are familiar with the material covered in the Quantitative Literacy Unit from Year 1. A CD-ROM was provided for revision purposes for students who studied that Unit during the last Academic Year and where necessary students should refer to that. Any students who are new to the University and, as a result, do not have access to such a CD-ROM should ask the tutor for a copy

NOTES